

PATENT APPLN. NO. 10/522,771
SUBMISSION UNDER 37 C.F.R. § 1.114

PATENT

IN THE CLAIMS:

1. (currently amended) In a sealed, nonaqueous electrolyte secondary battery having an outer casing which deforms as an internal pressure of the battery increases, said nonaqueous electrolyte secondary battery being characterized as using a material capable of storing and releasing lithium as the negative electrode material, and a mixture containing a lithium transition metal complex oxide and lithium cobaltate as the positive electrode material, said lithium transition metal complex oxide containing Ni and Mn as transition metals, having a layered structure and containing fluorine and obtained by adding heat treating a mixture of a fluorine compound [[to]] and raw materials used to formulate said lithium transition metal complex oxide.

2. (canceled)

3. (previously presented) The nonaqueous electrolyte secondary battery as recited in claim 1, characterized in that said outer casing is formed at least partly of an aluminum alloy or laminated aluminum film with a thickness of 0.5 mm or below.

PATENT APPLN. NO. 10/522,771
SUBMISSION UNDER 37 C.F.R. § 1.114

PATENT

4. (currently amended) In a nonaqueous electrolyte secondary battery which has a rectangular shape and includes positive and negative electrodes each having a rectangular electrode face, said nonaqueous electrolyte secondary battery being characterized as using a material capable of storing and releasing lithium as the negative electrode material, and a mixture containing a lithium transition metal complex oxide and lithium cobaltate as the positive electrode material, said lithium transition metal complex oxide containing Ni and Mn as transition metals, having a layered structure and containing fluorine and obtained by adding heat treating a mixture of a fluorine compound [(to)] and raw materials used to formulate said lithium transition metal complex oxide.

5. (currently amended) A sealed, nonaqueous electrolyte secondary battery using a lithium transition metal complex oxide containing Ni and Mn as transition metals and having a layered structure, as the positive electrode material, and having an outer casing which, when only said lithium transition metal complex oxide is used as the positive electrode material, is caused to expand by a gas generated in the battery while stored; said nonaqueous electrolyte secondary battery being characterized in that a mixture of said lithium transition metal complex oxide containing fluorine

PATENT APPLN. NO. 10/522,771
SUBMISSION UNDER 37 C.F.R. § 1.114

PATENT

and lithium cobaltate is used as the positive electrode material, said lithium transition metal complex oxide containing fluorine being obtained by adding heat treating a mixture of a fluorine compound [(tol)] and raw materials used to formulate said lithium transition metal complex oxide.

6. (previously presented) The nonaqueous electrolyte secondary battery as recited in claim 1, characterized in that said lithium transition metal complex oxide is represented by the formula $\text{Li}_a\text{Mn}_x\text{Ni}_y\text{Co}_z\text{O}_2$ (wherein a, x, y and z are numerical values which satisfy the relationships $0 \leq a \leq 1.2$, $x + y + z = 1$, $x > 0$, $y > 0$, and $z \geq 0$).

7. (previously presented) The nonaqueous electrolyte secondary battery as recited in claim 1, characterized in that said lithium transition metal complex oxide contains nickel and manganese in substantially the same amount.

8. (previously presented) The nonaqueous electrolyte secondary battery as recited in claim 1, characterized in that said lithium transition metal complex oxide has a mean particle diameter of 20 μm or below.

PATENT APPLN. NO. 10/522,771
SUBMISSION UNDER 37 C.F.R. § 1.114

PATENT

9. (previously presented) The nonaqueous electrolyte secondary battery as recited in claim 1, characterized in that said lithium cobaltate has a mean particle diameter of 10 μm or below.

10 - 11. (canceled)

12. (withdrawn-currently amended) A method for reducing a gas generated in a nonaqueous electrolyte secondary battery, while stored in the charged state, which uses a lithium transition metal complex oxide containing Ni and Mn as transition metals and having a layered structure, as the positive electrode material; said method being characterized in that lithium cobaltate is mixed in a lithium transition metal complex oxide containing Ni and Mn as transition metals and containing fluorine and which is obtained by adding heat treating a mixture of a fluorine compound [(to)] raw materials ~~in the preparation of used to formulate~~ said lithium transition metal complex oxide.

13. (cancelled)

14. (previously presented) The nonaqueous electrolyte secondary battery as recited in claim 4, characterized in that said

PATENT APPLN. NO. 10/522,771
SUBMISSION UNDER 37 C.F.R. § 1.114

PATENT

lithium transition metal complex oxide is represented by the formula $\text{Li}_a\text{Mn}_x\text{Ni}_y\text{Co}_z\text{O}_2$ (wherein a, x, y and z are numerical values which satisfy the relationships $0 \leq a \leq 1.2$, $x + y + z = 1$, $x > 0$, $y > 0$, and $z \geq 0$).

15. (previously presented) The nonaqueous electrolyte secondary battery as recited in claim 5, characterized in that said lithium transition metal complex oxide is represented by the formula $\text{Li}_a\text{Mn}_x\text{Ni}_y\text{Co}_z\text{O}_2$ (wherein a, x, y and z are numerical values which satisfy the relationships $0 \leq a \leq 1.2$, $x + y + z = 1$, $x > 0$, $y > 0$, and $z \geq 0$).

16. (previously presented) The nonaqueous electrolyte secondary battery as recited in claim 4, characterized in that said lithium transition metal complex oxide contains nickel and manganese in substantially the same amount.

17. (previously presented) The nonaqueous electrolyte secondary battery as recited in claim 5, characterized in that said lithium transition metal complex oxide contains nickel and manganese in substantially the same amount.

PATENT APPLN. NO. 10/522,771
SUBMISSION UNDER 37 C.F.R. § 1.114

PATENT

18. (previously presented) The nonaqueous electrolyte secondary battery as recited in claim 4, characterized in that said lithium transition metal complex oxide has a mean particle diameter of 20 μm or below.

19. (previously presented) The nonaqueous electrolyte secondary battery as recited in claim 5, characterized in that said lithium transition metal complex oxide has a mean particle diameter of 20 μm or below.

20. (previously presented) The nonaqueous electrolyte secondary battery as recited in claim 4, characterized in that said lithium cobaltate has a mean particle diameter of 10 μm or below.

21. (previously presented) The nonaqueous electrolyte secondary battery as recited in claim 5, characterized in that said lithium cobaltate has a mean particle diameter of 10 μm or below.

22 - 23. (canceled)

PATENT APPLN. NO. 10/522,771
SUBMISSION UNDER 37 C.F.R. § 1.114

PATENT

24. (previously presented) The nonaqueous electrolyte secondary battery as recited in claim 1, characterized in that said fluoride compound is LiF.

25. (previously presented) The nonaqueous electrolyte secondary battery as recited in claim 1, characterized in that a fluorine content of said lithium transition metal complex oxide is between 100 ppm and 20,000 ppm.

26. (previously presented) The nonaqueous electrolyte secondary battery as recited in claim 4, characterized in that said fluoride compound is LiF.

27. (previously presented) The nonaqueous electrolyte secondary battery as recited in claim 4, characterized in that a fluorine content of said lithium transition metal complex oxide is between 100 ppm and 20,000 ppm.

28. (previously presented) The nonaqueous electrolyte secondary battery as recited in claim 5, characterized in that said fluoride compound is LiF.

PATENT APPLN. NO. 10/522,771
SUBMISSION UNDER 37 C.F.R. § 1.114

PATENT

29. (previously presented) The nonaqueous electrolyte secondary battery as recited in claim 5, characterized in that a fluorine content of said lithium transition metal complex oxide is between 100 ppm and 20,000 ppm.